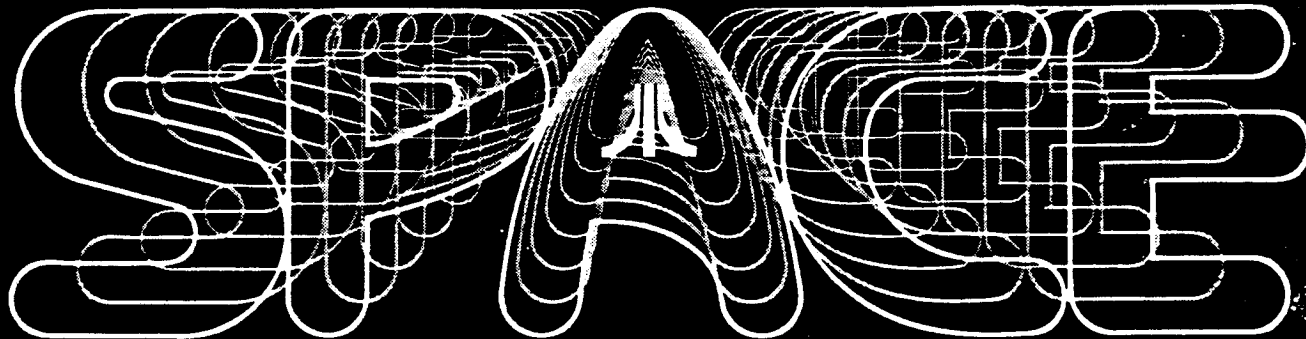


Saint Paul ATARI Computer Enthusiasts



An independent computer user group

DECEMBER 1985

December meeting: Friday, December 13 at 7:30 PM
Don't forget our NEW MEETING PLACE!

THIS MEETING: Ray Douglas of the Computer Broadcasting Co. will fill us in on what is happening in the world of computer information (programs) being broadcast via radio. His radio show on WWTC 1280 AM, Computer Line, is the first in the Metro area to offer this new and unique way of obtaining public domain software. We hope to have a demo; come to the meeting and find out!

Bruce Haug...President	774-6226	Bob Rhode....Editor	222-3596
Jim Schulz...Vice-Pres	537-5442	Bob Siede....Treasurer	489-3982
Frank Haug...Disk Lib.	774-6226	Bob Floyd....Secretary	487-2627
Jim Siede....Paper/Educational Librarian	489-3982		
SPACE/TAIG Bulletin Board...473-2897			

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SPACE December, 1985

CHRIS CRAWFORD
ASSEMBLY LANGUAGE COURSE LESSON SIX

SpartaDOS Construction Set
Reviewed by Mark Vallevand.

Public Domain Modem Software
By Joe Danko

Flight Simulator II
Review by Jeff Nelson

DISK OF THE MONTH

November Meeting Minutes
by Bob Floyd

The last SPACE meeting was held Friday, November 8 at our new meeting place, the Falcon Heights Community Center. There were 70 people in attendance. In "Rumors", it was reported that ST-BASIC has shipped and that Infoworld's Dvorak preferred the ST over Amiga. It was also noted that OSS is now supporting the ST with a disk utility and a Pascal language.

In the presidents report, it was announced that Synapse has finally released the 130XE versions of SynFile+ (4x larger files) and SynCalc (3x larger spreadsheets) as upgrades for \$10.00 for registered owners. Computer Exercise World is not an authorized ATARI dealer after all, and will not be handling ATARI's. Elections were held with only one person nominated for each post. See the list of new officers in the December newsletter.

In the vice president's report, Bruce related an article in the Minneapolis paper comparing the S20ST to the AMIGA and Mac. Bruce also discussed the possibility of starting an ST sig as part of SPACE. Those interested should contact Bruce.

The library now has the Homepak customizer. This is handy for those with 130XE's, 1050 drives or R-verter's. It can also help in character set selection, Ion/Ioff, and removing auto linefeeds (necessary for Delphi). PACE will be sending 2 public domain graphics disks for use with Print Shop soon.

The treasurer, Max Feuer, reported that the club has \$1143.23 at this time with about 100 members. Bob and Bruce pointed out that the large balance was due to better than expected sales of DOM's and ANALOG DOM's. The bank balance will probably go down somewhat due to our new meeting room.

The following programs were demo'd:

1. Power Star - Phyllis of Wizard's Work showed this educational graphic/text adventure. It is cartridge based and features 63/252 rooms (63 rooms x N,S,E,W views).
2. The Eidolon - Steve Pauley of Mindtools showed this latest Lucasfilm/Epyx release, which features fractal landscape graphics and exquisite animation. The story line involves being transported in a time machine to a cave-like maze.
3. LodeRunner's Rescue - Steve also showed this program from Synapse. It features a 3D LodeRunner type game with over 30 screens and screen editor. You are cast as LodeRunner's daughter who must try to reach LodeRunner to save him.

BYTES FROM THE PRES.

Well here I sit with the snow all shoveled and a first official newsletter article that is going to be late!

The first problem I ran into as Pres. of SPACE was the fact I'm OLD-FASHIONED! I tried to sign on to "Viewtron" a modem data base system similar to CompuServe. First I should give you some facts: I met and talked to Mr. Daniel Lee Smigrod of Viewtron at the Computer Show at the St. Paul Civic Center, Nov. 3, and he had Free software to enable computer users to gain access to Viewtron for just about every computer except ATARI. He gave me a "Generic" startup kit and stated if I could gain access he would send me startup kits for all of our members! This is where my "old fashion" troubles began. I can gain access to the system, but I can't "Sign On" due to the fact I don't have a "Major Credit Card" - VISA, Master Card, American Express, etc.

Problem #2: CompuServe - same thing no major credit card - but Bob Floyd is retrieving the info for our meeting.

Now that I discovered this fact guess what happened! All major credit Card Companies quit sending me their "get one free" type of offerings in the mail every two weeks. Well, by next month I hope to have one. Maybe you can teach an "Old Dog New Tricks".

THE NEW PRES

CHRIS CRAWFORD
ASSEMBLY LANGUAGE COURSE
EXCLUSIVELY FOR
WORLDWIDE USERS NETWORK
LESSON SIX:
SUBROUTINES & THE STACK



We now take up the first topic in this series that is not absolutely essential to writing programs: subroutines. The loops and indexed addressing discussed in the previous lecture are truly essential: it is hardly possible to write a useful program that has no loops. Subroutines are a matter of convenience, not necessity

It is quite possible to write an entirely adequate program without using a single subroutine. However, you will find that the convenience of subroutines with large programs is so great that you would never want to write such a program without them.

The primary purpose of a subroutine is to perform some function that is frequently needed at many points in the program. Instead of having to repetitively insert the same code over and over again, we simply write it once, place it in a subroutine, and call that subroutine many times from the main program. The use of subroutines dramatically reduces the size of a program.

Subroutines are implemented on the 6502 in a fashion very similar to that used by BASIC. You may recall the two BASIC commands for subroutines: "GOSUB lineno" and "RETURN". The two corresponding 6502 commands are "JSR label" and "RTS". The label in "JSR label" is the label of the beginning of the subroutines.

Thus, writing and using subroutines in 6502 is trivially simple. First, you write the subroutine. You give it a name (say, "MYSUBR") and stick that label in front of the first instruction. You put an RTS command after the last normal command of the subroutine. To call the subroutine, you just put JSR MYSUBR. That's all it takes!

However, in order to understand how it works is not so easy. Here's the problem we must solve when the 6502 jumps to a subroutine, the JSR instruction tells it the destination address to which the 6502 must jump. But when the 6502 hits the RTS instruction, how does it know the address to which it must return?

The RTS doesn't say, "Return to THIS address"; it says only "Return". Moreover, how could the 6502 know where to return? If the subroutine can be called from, say, five different points in the program, how would the 6502 know which of those points to which it must return?

What if we gave the 6502 a special register for remembering return addresses? That is, whenever the 6502 encounters a JSR instruction, it stores the current address into its return address register. Then when it encounters an RTS instruction, it simply takes the address out of the return address register.

There is only one problem with this: what if we use nested subroutines (one subroutine calls another)? The second subroutine call will erase the return address for the first subroutine call. Trouble!

The solution to all this is called a stack. A stack is a chunk of RAM allocated for certain special operations such as subroutines. The 6502 stack is stored on page one — that is, addresses \$0100 to \$01FF. The stack operates like 128 return address registers arranged in sequence (remember: two bytes per address). The 6502 keeps a stack pointer register to keep track of which byte in the stack is currently being used.

I will now trace through the operation of the stack in a subroutine. We start with the stack pointer set equal to \$FF. That means that the stack is empty; the stack pointer is at the very top of the stack. The 6502 encounters a JSR instruction. It takes the current value of the program counter and breaks it into two bytes. It pushes the first byte onto the stack. This means that it stores the first byte at \$01FF, then decrements the stack pointer. Now the stack pointer is \$FE.

Then the 6502 then pushes the second byte of the return address onto the stack, storing that byte at \$01FE and decrementing the stack pointer to \$FD. Then the 6502 jumps to the subroutine. When it encounters the RTS instruction, it pulls the two address bytes off of the stack (increments stack pointers and loads byte at address \$0100,SP). Those two bytes go directly into the program counter, returning the 6502 to the original entry point.

The advantage of this approach is that it allows very deep nesting of subroutines. If one subroutine calls another, the 6502 simply stores more values onto the stack. The addresses won't be confused because you always exit subroutines in exactly the reverse of the order that you entered them.

You can use the stack yourself, if you wish. You have six instructions that allow you to play with the stack: PHA, PLA, PHP, PLP, TSX, and TXS.

The PHA instruction pushes the value of the accumulator onto the stack and decrements the stack pointer. The PLA instruction increments the stack pointer and pulls the current stack value into the accumulator. These two instructions allow you to store and retrieve values onto the stack. They must be exactly balanced, though, or you will generate that most feared of bugs, the stack crashes.

Consider: you are in a subroutine. You push a value onto the stack, but forget to pull it off. When the 6502 attempts to return to its original location, it pulls two address bytes off the stack — but they're the wrong two bytes. One of them is the value you pushed but didn't pull. Result: the 6502 return to the wrong address. You

program goes haywire and the computer crashes.

This is called a stack crash. This type of crash tends to be particularly difficult to recover from. Prevention is the best medicine here. The rule for preventing stack crashes is simple and absolute: each and every push onto the stack must be balanced by one pull from the stack. Violate this rule and you will certainly experience a stack crash.

The next pair of stack manipulation instructions are PHP and PLP. These push and pull the process status register onto the stack. They are useful for two purposes. First, you may wish to save the values of the various flags before performing some operation, then restore them so that you can branch on a previously created condition. Second, it is sometimes handy to PHP, then PLA to get the processor status register into the accumulator where you can more directly manipulate it. Again, each push must be balanced by one pull.

The third stack manipulation pair of commands do not modify the stack. They are TSX and TXS. These transfer the stack pointer to and from the x-register. Once in the x-register, you can change the value of the stack value and then TXS to jump over sections of the stack. This can be a very handy way to pass parameters to subroutines, but it is also very tricky. If you make a mistake, you will generate a stack crash. So be careful with this one. I have always avoided these commands like the plague. They are very dangerous and never essential.

ST NEWS

SPACE will have a 520 ST Special Interest Group (ST SIG), but as of now we only have a leader, but no place to meet. We tried to get Minnesota Federal, Lexington and Larpentuer, where we used to hold SPACE meetings, but it is not available at this time. Come to the meeting for more information - Next month there will be a ST SIG NEWS section added to our newsletter, hopefully written by a member of the new group.

P.S. There will not be additional dues as of now to belong to the ST SIG - your SPACE membership is all that is required!

8-BIT NEWS

The only program I have seen so far is "Print Shop Companion", but I don't know if our local dealers have it in stock yet. When they do get it I hope they order enough, I want one for sure.

I heard that the ATARI 1020 printer is a very precision piece of hardware, but replacement paper and color pens are hard to find. If you know where to buy replacement paper and pens, drop me a note in the mail, or call me. Are they available locally or mail order only?

D.O.M. News

by: Frank Haug

Last month's praise must have gone to your heads because only ONE member donated to the DOM. Luckily, there was more than one program on the disk. So this month's disk looks a little skimpy. Hopefully I'll be able to add one or two more programs.

NOBODY approached me about my idea of people donating pictures to make a disk containing these picture files, to be sold as a separate disk or about the Electronic Arts' Pinball Construction Set games for another separate disk (The Games themselves not files loaded by it for its use) This will all depend on your support. If nobody gets in touch with me by New Year's, then there will not be an extra disk for January 1986. I believe that such a disk would sell well and be very good for trading.

Aside from the DOM we will be selling a Separate disk for \$4.00, the AMS Christmas music that we sold last year, for the new members who do not have any Christmas music. Of course we will also have some of the music players there, which are needed to play the music.

Now on with the programs on the December 1985 D.O.M.

1. BALLSONG.COM - A graphic/music demo.
2. ANDROTON.COM - AN arcade game for which I have no instructions.
3. MONEY.COM - Another arcade game where you use the joystick to pick up the money and the trigger to place bars across the path to block deadly (robots?).
4. FILLERUP.COM - A QIX clone, you must fill up the screen and avoid the sparks and the moving lines(Qix).
5. POPCORN - Move the hat to catch the falling popcorn.

The ribbon RE-INKER is ordered, hope it is here by meeting time!!!

SpartaDOS Construction Set
Reviewed by Mark Vallevand.

The SpartaDOS Construction Set (SDCS) from ICD, Inc. contains several versions of the SpartaDOS operating system, and a very extensive set of utilities, games and demos. SDCS is packaged on 3 sides of 2 diskettes, and includes a 160 page owner's manual. The retail price is \$69.95 with the US Doubler kit, and 39.95 without the kit.

SpartaDOS

SpartaDOS is quite simply the best DOS available for the ATARI personal computer series. Its power, flexibility, and supporting utilities cannot be matched by any other ATARI DOS. SpartaDOS features include:

- * Totally memory resident.
- * File timestamps.
- * Subdirectories.
- * Command driven.
- * ALL diskette formats supported.
- * Automatic diskette format recognition.
- * Input and output redirection.
- * Program access to SpartaDOS I/O routines.
- * Program access to SpartaDOS data structures, including the command line.
- * Wildcards for file names.
- * Keyboard buffering
- * Ramdisk support.
- * Ultra Speed and Happy modifications supported.

And there are many, many other features available to the SpartaDOS user.

Construction Set

The Construction Set is an interesting name for the six versions of SpartaDOS and their supporting utilities. Construction of your DOS depends on the model of ATARI personal computer you want to use, and the functionality you want the DOS to have.

SpartaDOS versions 1.x will work with any model, but are slightly limited in functionality due to memory size constraints of the 400/800 models. SpartaDOS 1.x cannot access DOS 2 files directly (they must be converted and copied to a SpartaDOS 1.x diskette by a utility program), and cannot take advantage of XL/XE features. SpartaDOS versions 2.x will only work with XL/XE models. 2.x uses the RAM under the OS ROMs to reduce low memory usage by about 4K. It has a much richer command set, and supports direct access to DOS 2 files.

The SDCS owner's manual documents 3 ramdisk commands. The Axiom RAMPOWER 128 is supported under SpartaDOS 1.x on an ATARI 800. The second 64K on the ATARI 130XE is supported as a ramdisk. The RAM under BASIC in an ATARI

supported as a ramdisk. The RAM under BASIC in an ATARI XL/XE can also be used as a ramdisk when in BASIC. There are 2 other undocumented ramdisk commands. One command is for the 256K 800XL modification designed by Claus Buchholz, and described in a Sept., 1985 BYTE article. The second undocumented ramdisk command is for a 192K 130XE modification designed by Ron Boling. The file RD.DOC describes the usage of these two commands.

The SDCS owner's manual is bound like a paperback novel. It does not open and sit on your table very nicely. It should have been spiral bound or loose leaf to make reference usage easier. The manual is well written, it is reasonably organized, and comprehensive.

UltraSpeed Doubler

The US Doubler is a two chip set which is installed in a 1050 disk drive to convert it to a high speed double density drive. The resulting drive is fully compatible with any other double density drive. When used with SpartaDOS, the data transfers are about 3 times faster.

The SDCS owner's manual clearly describes the installation of the replacement chips. The installation might require soldering two jumpers to correct positions. The jumper positions depend on the manufacturer of one of the chips. If you do not want to attempt the replacement yourself, ICD will do it for \$15, including return shipping.

The SDCS owner's manual also describes the US Doubler interface. That is, it describes all the SIO commands which are supported by the US Doubler. The US Doubler is only sold with SpartaDOS.

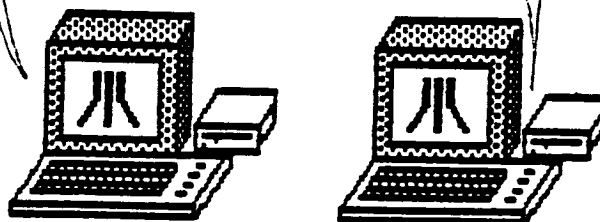
The Bottom Line

This is the best buy in the ATARI market today. It is the last DOS you will ever need. It is the fastest your 1050 disk drive will ever run.

PSSST! What did the ATARI 520 ST say to the AMIGA?

Look, I don't have time for these stupid jokes of yours, So will you Please Leave ME ALONE?

Well... Close enough!



Public Domain Modem Software
By Joe Danko

There is a great variety of public domain software available for your ATARI to use with a modem. The only problem is that a lot of it has to be used in the correct combination. I will try to lay out what I know to be some working combinations that I have used with the ATARI 1030 modem. Most will also work with the ATARI 835 modem except for tone dialing.

There are three main types of terminal software:

A. Terminal Programs

AMODEM

Most versions require ATARI BASIC and have many 'bells and whistles'. The latest version is Amodem 7.1. All versions require the use of an "R:" or a "T:" handler. When used with a 1030 and the "T:" handler, AMODEM 7.1 will execute automatic tone dialing.

TERM1030

Somewhat equivalent to AMODEM, TERM1030 requires an "R:" handler. It has a unique feature that allows the transfer of disk data in raw sectors between two ATARI's.

1030 EXPRESS

Written and compiled in ACTION, this is a complete package that does nearly everything you need. It is functionally equivalent to AMODEM 7.1 with "T:" handler and RDIAL.

KERMIT1030

Must be used with a "T:" handler. The main function is the implementation of the only standard file transfer protocol I know of between most mainframe systems and micros systems.

TSCOPE

The 1030 version is written in 'C' and requires no separate handler. The purpose of TSCOPE is to implement the CIS 'A' file transfer protocol used on COMPU SERVE for the transfer of binary data files.

DISKLINK

This is a machine language program that needs no other programs or handlers to operate. Its claim to fame is a file transfer method similar to AMODEM but with the capability of low speed keyboard communication between

capability of low speed keyboard communication between users at the same that the files are being exchanged.

B. Modem Handler

This is a program that installs an "R:" and/or "T:" pointer in the operating system device handler table to allow software to access modems with standardized commands.

This type of software is usually used by naming it "AUTORUN.SYS" so that it loads at boot time. If the terminal program is BASIC it can be "RUN" at the "READY" prompt or the handler program will run it automatically. If the terminal program is a machine language "BINARY LOAD" file there are two ways to get going using "DOS". One is to use "MEM.SAV" and "DUP.SYS" with the "L" option. Load the handler file with a "/" after the filename then load the main program. The other way is to append the main program onto the handler file. The handler file should have an "INIT" address only and the main program should only need a "RUN" address. Name this compound file "AUTORUN.SYS" and just boot it up.

"R:" Handlers

There are at least two versions that work with the 1030. The original "R.BIN" or "RHANDLER" and an enhanced version, "RHANDLR2", that returns after <System Reset> and will automatically <RUN> a basic terminal program after booting if it has a filename extension of ".RUN".

"T:" Handlers

There may be others but the only "T:" handler I have used is the one that resides on ROM inside the 1030 modem. When the ATARI is booted with only a 1030 and no disk it will automatically read the ROM in the 1030 and install the "T:" handler. Disk based programs that require a "T:" handler will run if a short program similar to one from the August issue of ANTIC is run first. 1030 EXPRESS has this function built in. The 1030 "T:" handler supports automatic tone dialing.

C. Support Programs

RDIAL

This is an ATARI basic program which will generate a phone number data base file for use with many versions of AMODEM for automatic dialing.

TD1030

This is a basic program that will tone dial on the ATARI 1030, mainly for use as a model for programmers to use to develop this function in their own applications.

The following is a list of usable disk configurations:

TERM. PGM	LANGUAGE	DISK CONFIG.
AMODEM 7.1	BASIC	1- DOS.SYS 2- DUP.SYS 3- AUTORUN.SYS (R: OR T:) (HANDLER) 4- AMODEM71 5- RDIAL
AMODEM I.X	BASIC OR COMPILED	SAME (MAY NOT BE ABLE) (TO USE T:HNDLR)
TERM1030	BASIC	1- DOS.SYS 2- AUTORUN.SYS (R:HANDLER) 3- TERM1030
1030EXPRESS	ML-ACTION	1- DOS.SYS 2- AUTORUN.SYS
KERMIT1030	ML	1- DOS.SYS 2- DUP.SYS 3- THANDLER 4- KERM1030 OR 1- DOS.SYS 2- AUTORUN.SYS
TSCOPE	ML-C	1- DOS.SYS 2- AUTORUN.SYS
DISKLINK	ML	1- DOS.SYS 2- AUTORUN.SYS

If anyone needs assistance or new information leave E-MAIL for me on the TAIG/SPACE BBS in the HELP section.

I will have a few 1030 MODEM SOFTWARE DISKS TO SELL FOR \$6.00 each at the SPACE monthly meeting in december. Profits go to the maintenance of the BBS. See you all there!!!

Flight Simulator II
Review by Jeff Nelson

This is the most advanced, realistic flight simulator yet made for the Atari. Made by SubLogic, the program requires at least 48K of memory (it uses the 64K in the 800XL) and one disk drive. One or two joysticks are optional as well as your own blank disk to store your location (a final approach, etc.)

If all you're after is just a flying game, this isn't it. The plane you are controlling is closely modeled after a Piper Archer and has all of its instruments, controls, and flight characteristics. In addition to the control stick and rudder pedals, the pilot can manipulate the throttle, mixture, flaps, carburetor heat, magneto switch, and choose between left or right fuel tanks. Three radios are included with you can navigate and do precision instrument approaches. Over 80 airports are available to fly to and from, many of which have VOR and NDB radio facilities co-located. Scenery areas are the Seattle, Chicago, Los Angeles, and New York areas. In Chicago some of the details visible out the window are Lake Michigan, the John Hancock and Sears buildings, and highways (in addition to the airports). New York has the Brooklyn Bridge, Statue of Liberty (you can actually see her face!), and the World Trade Center. Los Angeles and Seattle both have mountains in addition to their cities and oceans.

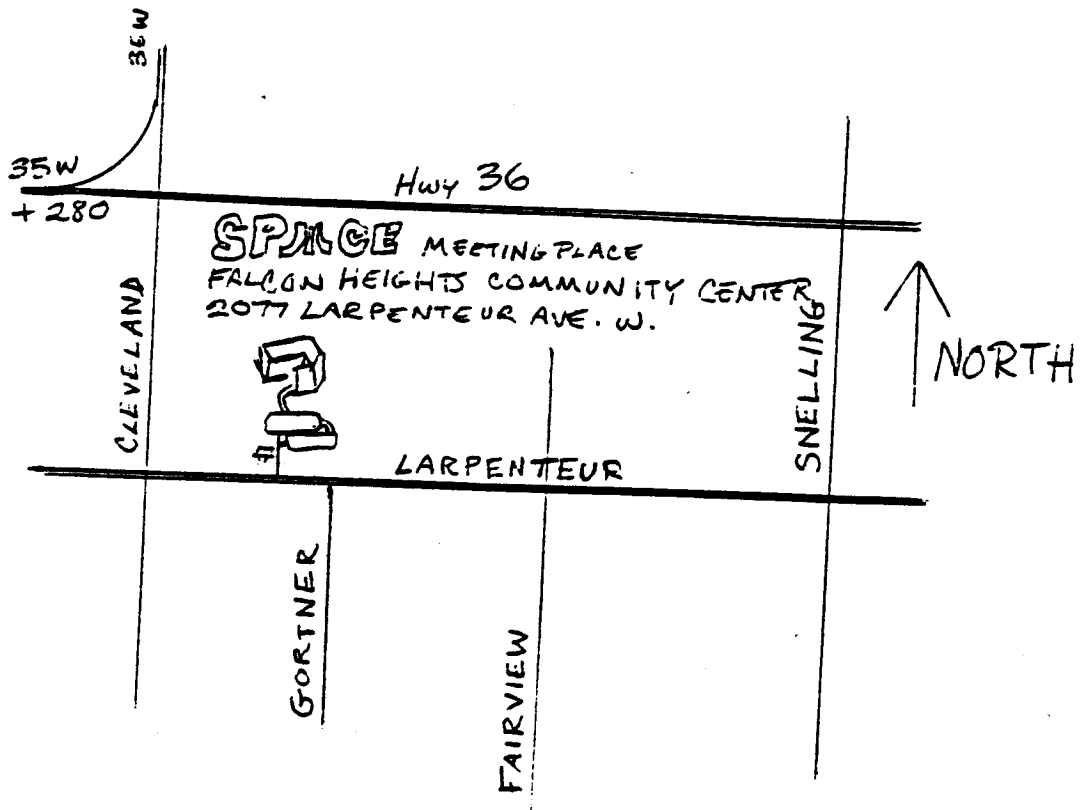
Pushing ESC while operating the plane allows you to adjust the time of day (it gets dark after nine), the season, latitude and longitude, up to three cloud and wind levels, and the aircraft's orientation. If a crash appears imminent, just push ESC and add 20,000 feet to your altitude.

Flying qualities are good, but it takes a while to get a feel for the controls. I am a pilot myself and still was unable to make a successful landing for a couple of hours. The computer takes everything into account, adjusting attitude, airspeed, and altitude when you make a change in power or pitch. It stalls just like the real one, and can handle simple aerobatics. I've done rolls, loops, and several other maneuvers that I'm not quite sure have names. SubLogic says in one of the manuals they are negotiating with the FAA to have the program certified to allow you to log simulator time in your pilot's logbook. Incidentally, there are two manuals that come with the program that cover basic aerodynamics, the controls, "how to fly", and everything else necessary to either a novice or experienced pilot.

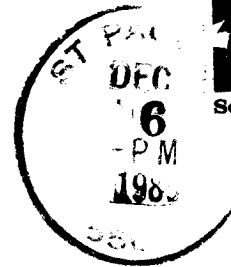
If you still aren't convinced a flight simulator is a good piece of software for you, try the WWI Ace option. Radios are removed from the instrument panel and you're in command of a WWI fighter. Your mission is to blow up enemy factories and shoot down the defending airplanes. This is the most realistic flying game I've seen and yet is simple enough to manage that it's still fun.

Well, this just about wraps up my first issue. You set a pretty tough standard, but I hope I lived up to it.

Actually, I hope you're happier with it than I am, because my printer took an unannounced vacation the day before I sent this to the printer. I did the best I could with my scattered rough drafts. Still, I'm satisfied that I did a good job, and I hope you are, too! -The ED



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